Expert Grup
CENTRU ANALITIC INDEPENDENT

THE IMPACT OF THE RUSSIAN WINE EMBARGO: ESTIMATION OF THE ECONOMIC IMPACT

USING A COMPUTABLE GENERAL EQUILIBRIUM MODEL FOR ANALYZING THE IMPACT OF THE ECONOMIC POLICIES RELEVANT FOR MOLDOVA'S EUROPEAN INTEGRATION

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ABOUT THE PROJECT

This document was developed as part of the project "Using Computable General Equilibrium Models (GCE) with Micro-Simulations to Analyze the Economy-Wide Impact of Economic Policies Relevant for Moldova's European Integration". The project was implemented by the Expert-Grup independent think-tank (Republic of Moldova) with the training and methodological support provided by the Kiel Institute for the World Economy (Germany). The financial support for this project was offered under the auspices of grant L9089, "The Policy Think Tank Bridging Initiative – Policy Research and Advocacy" of the Policy Association for an Open Society – PASOS funded by the Local Government and Public Service Reform Initiative of the Open Society Institute (LGI).

The main goal of this project was to create a platform for knowledge transfer from the Kiel Institute for World Economy (Germany) to the Expert-Grup think-tank (Moldova) on the use of Computable General Equilibrium (CGE) models and micro-simulations based on household data for economic policy analysis and for joint research using those analytic tools. This project addressed the limited capacity for professional quantitative analysis of economic policy in Moldova. By providing in-depth policy analysis and simulation, this project responded to the "Good Governance", "Convergence with EU sectoral policies" and "Economic Integration" priorities identified in the Eastern Partnership component of the European Neighborhood Policy. The project is highly relevant also in light of priorities identified in the EU's National Indicative Plan for the Republic of Moldova (Priority 1: Reform of the public administration and public finance management; Priority 3: Support in Poverty Reduction and Economic Growth). At the same time, this project addressed real policy issues that are currently discussed in Moldova as part of the larger agenda of country's European integration.

In the framework of this project, Expert-Grup used its newly acquired skills for doing research on three examples of specific policy changes currently discussed in Moldova: 1) Impact of EU integration on the Moldovan agro-industrial sector; 2) Economic impact of liberalization of the visa regime with EU on Moldovan economy; and 3) Potential impact of a new Russia embargo against wine imports from Moldova. Results of the research will be used for conducting targeted policy advocacy, assisting in policy planning and raising awareness of the Moldovan government on these policy issues and of the EU policymaking community regarding Moldova's needs.

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General introduction: the Computable General Equilibrium models

What is a CGE model?

In theoretical and applied economic analysis the Computable General Equilibrium (CGE) models are represented by (usually very large) systems of linear and/or non-linear equations describing the behavior of economic systems varying from a household to national economy to global economy. This class of models is used for analyzing how policy changes and other economic shocks propagate through the economy. A CGE model basically shows how the economy moves from the initial equilibrium to the new one and what structural and quantitative changes accompany the shock.

There are many types of CGE models used in the applied economic analysis. The neoclassical models hinge on the traditional features of the Walrasian general equilibrium theory: firms maximize their profits, consumers maximize their utility, factors of production are fully employed, while equilibrium is achieved through changes in prices/wages. The CGE models built in the structuralist tradition allow for factors unemployment and for rigidities in wages/prices and make use of different assumptions about the macroeconomic balancing mechanisms. CGE models can be static (comparing only different equilibriums) or dynamic (showing how economy evolves towards the new equilibrium). While most of the CGE models deal only with the real part of the economy, some models may also include financial flows and monetary sector.

The CGE models are implemented based on the so-called Social Accounting Matrixes (SAM) for a given year. SAMs are comprehensive, economy-wide and detailed data sets, taking form of a square matrix describing real and monetary flows among different economic agents: activity sectors, commodities, households, enterprises, government and rest of the world. The level of disaggregation within the groups of economic agents – i.e. the number of accounts - depends on the statistical data available and purpose of analysis. In the SAM each account is represented by a row and a column, with the account's income appearing along the raw and its expenditures along the column. The underlying principle applying in building a SMA is the equality involved by the double-entry accounting: for each account the total revenue (row-wise) equals its total expenditure (column-wise). To assemble a SAM it is typically necessary to combine information from many sources, such as national input-output accounts, household budget surveys, labor force surveys, fiscal and trade statistics.

A particular feature of the CGE models is that they explicitly recognize that changes affecting one part of the economy can have repercussions throughout the rest of the economy. They are particularly useful in capturing the indirect effects of a policy change on the entire economic system. CGE models are therefore very powerful analytical tools to influence policymaking. The range of issues suitable for a CGE-based analysis is very

large and includes structural adjustment, trade, fiscal, budgetary, agricultural, income redistribution, environmental and energy policies[1].

These models are widely used in many countries to understand and evaluate potential impact of policy but are absent in current policy discussion in Moldova. Using them will make for a quality shift in policy dialogue in Moldova. Most of the policy areas where CGE models would be particularly useful are directly related to Moldova's European integration policy. Such type of models would be particularly useful for applied economic analysis in Moldova, where the ambitious reform agenda demands professional ex-ante analysis of the policy changes. CGE model will provide necessary analytical support and alternative scenarios to feed public discussions with domestic and foreign partners on Moldovan economic policy. When combined with micro-simulations based on household data, CGE models will also give a sense of how the income distribution and poverty will change, which remains of crucial importance in Moldova.

FEATURES OF THE MOLDOVAN CGE MODEL

The CGE model developed for the purposed of this project is an extension of the IFPRI standard model that is fully documented in Lofgren et al. (2002). This model includes both structuralist and neoclassical features, including only the real economic flows, without considering the assets sector, inflation and banking sector. Considering the small size of the Moldovan economy any changes in the economic and trade relations with EU are normally expected to impact only Moldova. Therefore, the CGE has been built as a single country model assuming perfectly elastic demand for Moldova's exports and perfectly elastic supply of Moldova's imports.

The Moldovan CGE model is a comparative-static model, i.e. its use is limited to the analysis of the short- to medium-term effects of the policy and economic shocks. The model is therefore not suitable to analyse long-term dynamic effects arising, for instance, from the growths in the capital endowment. The database for the Moldovan CGE model is the Social Accounting Matrix (SAM) for 2008. The 2008 SAM combines information from input-output accounts, national income and product accounts, household budget surveys and labor force statistics provided by the National Bureau of Statistics. Some data have been taken from the fiscal statistics published by the Moldovan Ministry of Finance, while other data originate from the Balance of Payments compiled by the National Bank of Moldova. The 2008 GCE model for Moldova is based on very detailed SAM with 107 accounts, including:

- 37 activities (primary, manufacturing, and service sectors, with agriculture disaggregated into commercial enterprises versus small family farms with household consumption);
- 36 commodities;
- 3 accounts for transition costs (domestic, export and import);

[1] For a comprehensive overview of the use of CGE models see Devarajan and Robinsons, 2002.

- 6 factors of production: low-skilled, medium-skilled and high-skilled labour, capital, self-employment in agriculture and self-employment in other sectors;
- 8 household types: pensioners, urban-based public employees, rural-based public employees, small farmers, employed in big agricultural companies, others in big cities, other in small towns, other rural;
- 1 account for enterprises and 1 account for government;
- 8 accounts for different types of taxes;
- 4 trading partner regions: EU-27, Russia, other CIS countries, other countries.

In this model production is carried out under the assumption of perfect competition by sectors maximizing their profits, subject to a nested production function. For each activity, the top level of the production function is a Leontief function combining factors of production and intermediate inputs. At lower level, factors of production are combined according to a constant elasticity of substitution (CES) function, while the intermediate inputs are used in fixed proportions (Leontief function).

Aggregate domestic output is allocated by producers to exports and domestic sales based on the criteria of maximizing the profit with given prices, a given quantity of total output and imperfect transformability between domestic sales and exports. The degree to which output for domestic use can be transformed into export is given by a constant elasticity of transformation (CET) function. Exports to each trading partner region are similarly determined on the basis of a CET function that implies imperfect transformability between exports to the various regions. The model assumes a small price-taking economy. Domestic demand for a given good is the sum of demand for private consumption, government consumption, investment, and intermediate inputs. The optimal mix of imported and domestic goods is determined through cost minimisation via a CES aggregation function. Demand for imports from each trading partner region is similarly determined through a CES aggregation function for imports from the various regions.

The macro closure rules for the CGE model define the mechanisms by which the three macroeconomic balances are determined: (i) the current government balance; (ii) the current account balance, and (iii) the savings and investment balance. In this model the 'standard' closures have been used: governmental savings are fixed, while direct taxes are fixed; private savings are investment-driven such that the marginal propensity to save adjusts to a given level of investment; exchange rate is assumed flexible, while foreign savings fixed. Factor market closures determine the mechanisms that equilibrate the supply and demand of each factor of production. In our simulations we have experimented combinations of three types of factor market closures: (i) a factor is fully employed and mobile; (ii) a factor is fully employed and immobile; or (iii) a factor is mobile but may be unemployed.

This CGE model may be thought of as representing the optimal description of the Moldovan economy given the available data. This feature renders the 2008 Moldova CGE models appropriate as an easy-to-use tool to be used by various stakeholders in the economic policy analysis.

OVERVIEW OF THE MOLDOVAN WINEMAKING SECTOR

The summer of 2010 seemed a replay of the old well-known story: Moldova wines were banned from Russian market on the reasons allegedly related to the non-compliance to the Russian food safety standards. Leaving aside the debate on the real reasons for the embargo, the real effects have been clear: with almost half of total wine export destined to the Russian market, the already crippled Moldovan wine industry has been set to suffer even more. The 'wine crisis' seems becoming a reoccurring feature and it is seems reasonable to attempt to rigorously assess the eventual harms done to the exports and economy as a whole. At the same time, the EU appears to be ready to lend helping hand to Moldova by doubling quotas for Moldovan wine exports to the EU market. While wine exports to the EU can in no way fully offset the adverse effects of the Russian embargo, the positive effects of increases in wine export quotas are also worth of gauging and introducing to the complete balance sheet. Both of the assessments could be then fed into the economic and foreign policy making.

MOLDOVAN WINE EXPORTS: TRANSITION IS STILL ON…

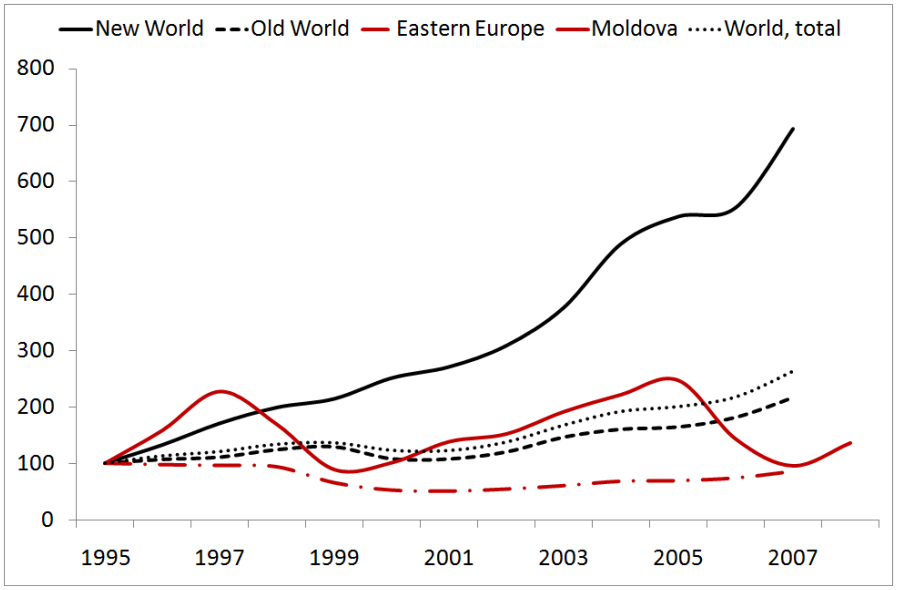
Moldovan wine sector overtly depends on the external demand as the country exports around 95% of wine produced. Moldova has long been proud of its wine industry which for some time has been seen as one of the economic jewels of the former Soviet republic and newly independent state. At the same time, its story with its failures and indecisive successes is quite revealing also for evolution of Moldovan 'traditional' exports in general.

Since Moldovan wine exports are 'traditional', i.e. the industry was mostly developed during Soviet times[2], the Union's market as well as COMECON markets were seen as the main destination for Moldovan wine exports. No wonder, the demise of Soviet Union hit this industry, which appeared to be highly dependent on the Russian market. Furthermore, this development overlapped with another important trend on the global wine markets: the ascendance of the New World wines. At this background the wine exports from Eastern Europe, undercut also but the transition recession and stagnation of the wine industries, saw their global share shrinking dramatically from roughly 14% in the beginning of '80s to 4% in 2008[3].

Back in the mid-'90s, consumption traditions, remaining business connections, free trade agreement and lower quality standards transformed Russian and the CIS markets into safe haven for Moldovan wine exports. This haven shielded Moldovan wine industry and exports from storms of global wine market transformations, but also from increasing competitive pressures and needs for modernization (Figure 1).

[2] Obviously, this is not to say that the wine-making does not have a long history on this territory which can be traced back to the Roman times.
[3] Alex Oprunenco, "Sectorul vinicol: supraviețuind o nouă criză?", Expert-Grup, July 2009.

FIGURE 1. GLOBAL WINE EXPORTS, BY REGION, 1995-2007, 1995=100%.



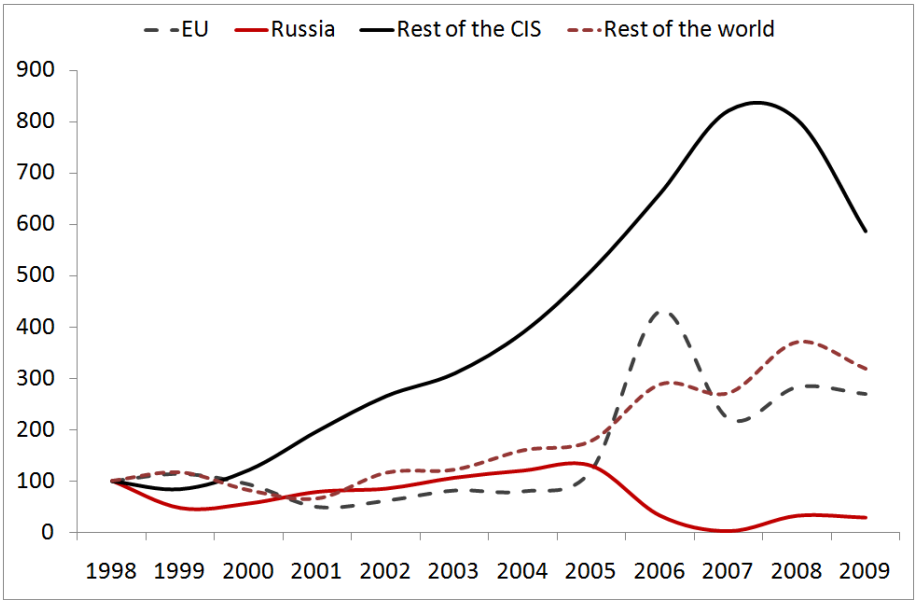
Source: UN Comtrade Database, FAO database.

There was no free lunch, however. Moldovan wine-makers may well indulged themselves in burgeoning exports to Russia, but the reckoning day came in the wake of the Russian financial debacle of 1998. Moldovan exports to Russia plunged (Figure 2), this however din not prompt swift reorientation of Moldovan exports.

The most important 'beneficiary' of forced diversification of Moldova exports turned out to be the CIS markets, which had mostly the same points of attraction for Moldovan producers as the Russian one. Moreover, as regional economic recovery set in at the beginning of 2000, Moldovan wine exports to Russia recovered. The EU markets remained much less desired destination for Moldovan wines throughout first half of this decade.

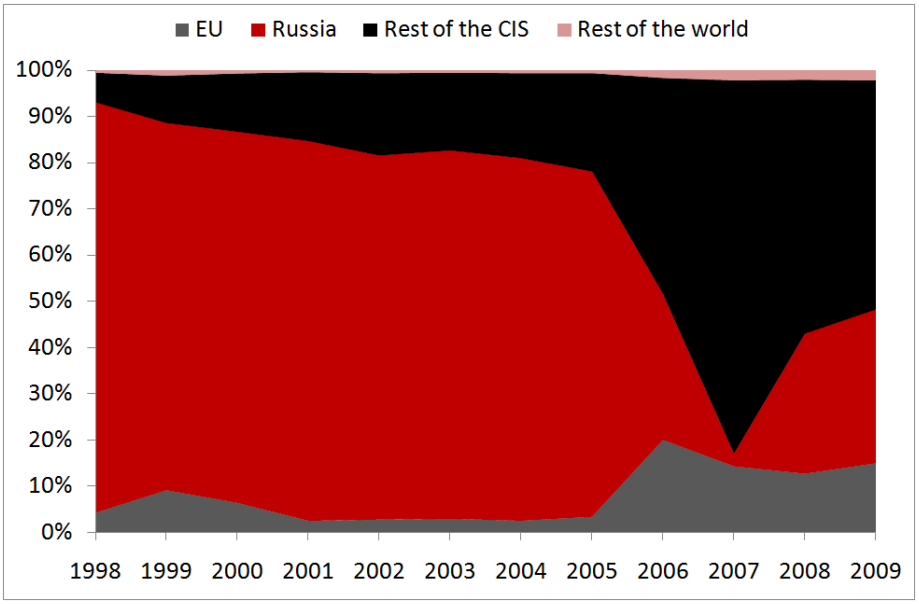
Thus, by 2006 prior to the first Russian embargo was established, Moldova exported almost 80% of its wines to Russia (Figure 3) and Moldovan wines held dominant position on the Russian wine market.

FIGURE 2. MOLDOVAN WINE EXPORTS GROWTH BY DESTINATION, 1998-2009, 1998=100%.



Source: UN Comtrade Database, authors' calculations.

FIGURE 3. SHARE OF MOLDOVAN WINE EXPORTS, BY DESTINATION, 1998-2009.



Source: UN Comtrade Database, authors' calculations.

In March 2006 Russian authorities declared ban on wine imports from Moldova citing quality concerns. This ban appeared as a shock for the whole Moldovan industry: enterprises were left with huge stocks of wine, while losses at that time were estimated by Moldova authorities to be at 200 mln. USD. The evolution of Moldova wine exports appeared to start changing since then. Initially, part of the wine exports was re-directed to Romania and Bulgaria in order to be re-exported to Russia. In 2007 Romania and

Bulgaria became the EU members meaning dismantlement of the free-trade agreements between Moldova and these countries and no tax-free exports of wine there. In a move partly offsetting these negative impacts the EU granted Moldova the ATPs, which included quotas for tax-free imports of wine from Moldova to the EU. The quotas were set to annually increase from 60,000 hectoliters in 2008 to 120,000 in 2012. Moldovan companies normally use the provided quotas fully. In 2010 they were almost used by October.

However, by the end of 2007 the wine ban was lifted by Russian authorities and Moldova was able to export wines to Russia again. Although exports failed to fully recover (in 2009 they reached only 22% of exports in 2005), Russia swiftly became the main wine importer from Moldova[4] holding over 33% of total exports. Other CIS countries accounted for almost half of Moldovan wine exports. For comparison the EU's share was only slightly less than 15% in 2009 (Figure 3).

Besides all the shenanigans related to the access to the Russian market Moldovan wine industry was severely hit by the global economic crisis. Overall, in 2009 Moldovan wine exports fell by 20% on yearly basis despite being on the robust upwards trend prior the crisis unfolded. Given the slow economic recovery any new wine embargo on the Russian side, which accounted for the third of the Moldovan wine exports in 2009 and weathered relatively well the crisis effects, would dent the recovery of the sector. And it remains to be seen to what extent exports to other regions, mainly other CIS countries and the EU, will be able to offset the adverse effects of the Russian ban.

EXTERNAL SHOCKS INTERNALIZED…

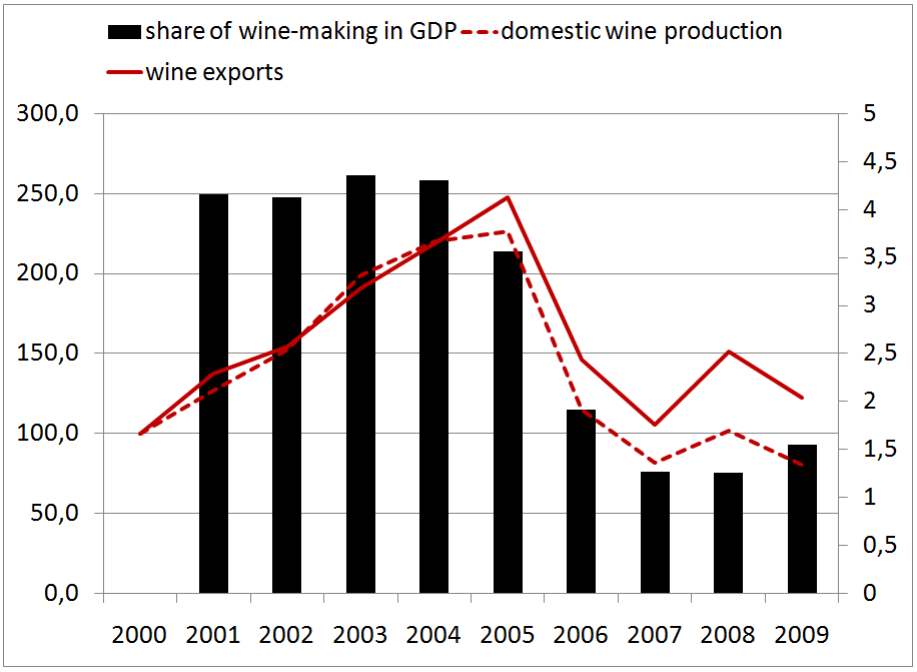
Given the small size of the local market (estimated 5% of total wine sales),[5] the developments in wine industry have closely followed the evolution of exports (Figure 4). In other words, Moldovan wine industry is extremely dependent on the external demand and vulnerable to external shocks whether global or regional economic recessions or administrative barriers imposed to trade. Little wonder then, the Russian embargo followed by the global economic recession left Moldovan wine industry in dire straits.

Thus, Russian embargo of 2006 represented by far the most severe blow to Moldovan wine industry. As 80% of Moldova wine exports were sent to Russian market, loss of this market led to steep decline in the domestic wine production, which fell y-o-y by 34% or was less than it was in 2000. The recovery since then was tepid, and in 2009 in the wake of the global financial crisis the Moldovan wine industry was yet again below 2000 level. Moreover, share of wine-making in GDP plunged in the aftermath of embargo from 4% to less than 1.5% (Figure 4). It increased slightly in 2009, but this gain reflects more GDP

[4] On the country level. On aggregate the CIS markets even without Russia have become the main, although most severe hit by the crisis, destination for Moldova wines.
[5] CEED, Moldova Economic Sector Analysis: Final Report, March, 2010.

contraction in the aftermath of the global financial crisis, than proper recovery of the sector as respective falls in production, exports and sales show (Figure 4 and Table 1).

FIGURE 4. EVOLUTION OF MOLDOVAN WINE PRODUCTION AND EXPORTS (BOTH LEFT-HAND, 2000=100%) AND SHARE OF WINE-MAKING IN GDP (RIGHT-HAND), %, 2001-2009.



Source: UN Comtrade Database, NBS, authors' calculations.

Moreover, it can be said that embargo represented a blow from which the wine industry have not been able to recover up to now (Table 1). As the effects of external shocks were internalized, the numbers of companies and personnel employed dwindled, while sales plunged. However, although sales managed to stabilize in the aftermath of the embargo, the number of active wine-making companies and people employed in the industry has continued falling since then. Indeed, some field reports show that the wineries had to lay out personnel, including highly qualified one. Many specialists have been leaving the companies because they have been underpaid or because the salary arrears have increased over the last 6 months. The sales, marketing, finance, and accounting personnel is the most mobile as it finds it easier to get employed in other sectors. The technical staff has been in a more difficult situation since it has no many other employment options as the whole industry has been depress and downsizing.[6].

[6] Ibidem.

TABLE 1. NUMBER OF COMPANIES, PERSONNEL EMPLOYED AND SALES INCOME IN WINE INDUSTRY, 2004-2009.

	2004	2005	2006	2007	2008	2009
no. of companies	235	238	236	220	197	191
average no. of employed, thou.	18,77	19,65	18,29	15,38	14,66	12,68
sales income, mil. MDL, constant prices	4597,89	5054,12	2781,8	2456,45	3012,48	2518,44

Source: NBS, authors' calculations.

Moreover, in the wake of the last export restrictions[7] (added to the effects of the embargo and global economic crisis), the wine-making companies were using only 30% of their productive capacity, holding debts of 1.3 billion MDL (approx. 108 m. USD) which are estimated to be tantamount to the overall value of their assets, and burdened with stocks of 22 million decaliters of wine much of which is unsellable[8].

Furthermore the dire state of the wine-makers reverberated into the financial realm. In the aftermath of the first embargo wine-making companies have come under financial strain as they lost money in Russia, the market outlook went dim and they find themselves unable to cover loans obtained from the banks. Indeed, reimbursement's problems in the sector began in a few months after the Russian ban. But it also prompted companies to work on quality management and market diversification. As result, banks expected situation to improve in 2008; and so it did. Then arrived the global financial crisis and it changed adversely the whole outlook for the sector[9]. As a result, banks tightened credit to the sector while many companies succumbed into insolvency: as of end of 2010 over 20 companies are insolvent according to the Association of the liquidators and administrators of Moldova[10]. One of the recent studies finds that access to bank credit became so dire that it is being replaced by the commercial credit received from clients in form of advanced payments, while the companies' investment programs were effectively canceled or postponed for an indefinite period of time[11].

Profitability of the wine enterprises also suffered. From 2005 to 2009 profit margins shrank from 30-35% to 5-10% because of various exogenous and endogenous factors, such as high fiscal burden, restrictive administrative framework and appreciation of national currency throughout most of 2005-2009[12]. In the end of 2009 – beginning 2010 all of these factors relaxed to some extent, but damage was done.

[7] According to the latest estimates only around 1% of total Moldovan wine exports to Russia were actually banned. http://vinmoldova.md/index.php?mod=news&id=24793
[8] BusinessClass, December 2010.
[9] CEED, Moldovan Wine Sector Appraisal, March-April, 2009.
[10] http://insolv.md/?action=show&cat=6&lng=3
[11] CEED, Moldovan Wine Sector Appraisal, March-April, 2009.
[12] CEED, Moldovan Wine Sector Appraisal, March-April, 2009.

Furthermore, the difficulties of the wine-making companies also affect grape producers which remain unpaid and/or are unable to repay loans to the banks, but also producers of the ancillary materials (bottle, cork, capsule, label, and paperboard). The farmers cannot apply for bank loans because most of them haven't been repaid yet by the wine producers and they couldn't fulfill their financial obligations towards the banks. The other wine sector suppliers such as bottle, label, cork, capsule producers and importers bear the consequences of crisis as well and still have to deal with the consequences of the ban because during the last 4-5 years many wineries have accumulated significant payment arrears[13].

Obviously, being in such a dire situation the whole sector needs a respite, not new export restrictions. But if they come, what would be their impact?

[13] Ibidem.

USING CGE MODEL TO SIMULATE IMPACT OF A NEW RUSSIAN BAN ON MOLDOVAN WINE IMPORTS

SETTING THE TASK…

Although Moldovan authorities estimated that the 2006 embargo provoked losses of 200 million USD, no rigorous estimates were made at that time. As the risk on new embargo is again visible on the horizon it makes perfect sense to try to estimate the impact of an eventual new embargo over Moldova's exports and economy.

Furthermore, following first halts of the Moldovan wine exports to Russia it appeared that the EU was ready to double its quotas for the tax-free wine imports from Moldova. Therefore it is reasonable to gauge to what extent this move might offset the adverse impact of an eventual wine ban on Russian side.

All in all, with high political uncertainty surrounding the wine issue we look in more detail at the 'embargo' scenario under the following assumptions:

Russia institutionalizes the embargo meaning no Moldovan wines have access to Russian market. The EU has already taken decision on increasing quotas for Moldovan wine by 80% (150,000 hectoliters in 2011 and 200,000 of hectoliters in 2012) in a move that among others could offset the adverse impacts of the Russian ban. Therefore, the task under this scenario is: *to quantitatively assess the combined impact over the eventual Russian wine embargo and rise in the EU quotas for wine exports from Moldova over the GDP, total exports and imports and their regional redistribution, and so forth*.

SEVERE SECTOR IMPACT BUT NOT THE ONE MOLDOVAN ECONOMY WOULD FAIL TO WITHSTAND…

For better understanding of the embargo impact we employ three scenarios, which are consecutive in time:

1. The first, super short-term scenario, let us dub it 'Unemployment' reflects the immediate shock impact of the embargo meaning unemployment of the fired staff and capital stuck in the wine sector;
2. The second short-term scenario, 'Immobility' envisages a some sort of after-shock recovery with labor moving to other sectors while capital remains stuck in the sector;
3. The third mid-term scenario, 'Full Employment', is based on the assumption of the shock's absorption both labor and capital moving in other sectors.

TABLE 2. CGE SIMULATION RESULTS: EVOLUTION OF THE SELECTED MACRO-INDICATORS UNDER 3 TEMPORAL SCENARIOS:

	UNEMPL-T	IMMOBILITY	FULL EMPL-T
GDP	-1.3	-0.8	-0.7
Exports	-1.7	-0.3	-0.2
Imports	-0.7	-0.1	-0.1
Real exchange rate (negative sign indicates real appreciation)	0.3	0.1	0.1

Source: authors' calculations based on CGE model.

The CGE simulations under these three scenarios show varying degree of impact of embargo throughout the period. Initially, embargo's shock leads to aggregate decline in exports of 1.7% and of 0.7% in imports. Overall, the embargo chips 1.3% out of the country's GDP. Real exchange rate depreciates by 0.3%. As both labor (excluding self-employed) and capital are stuck in the sector, there is little adjustment allowing other sector to offset negative impact observed in the wine-making sector.

As economy absorbs the shock and restructures the labor previously employed in the wine sector is freed, moves to other sectors and via flexible wage mechanism leads to decreasing labor costs across the sectors (Table 3). Hence, much more limited decline in exports (-0.3%) and imports (-0.2%) as well as more modest dip in GDP (-0.8%).

Finally, as adjustment proceeds and capital becomes fully mobile the negative impact of embargo is assuaged further. Exports and imports fall by 0.2% and 0.1%, respectively. Under this scenario the embargo dents GDP by 0.7%.

TABLE 3. EVOLUTION OF ECONOMY-WIDE WAGE (RENT), %

	UNEMPL-T	IMMOBILITY	FULL EMPL-T
Low-skilled labor		-1.7	-0.8
Mid-skilled labor		-1.6	-0.8
High-skilled labor		-1.7	-1.0
Capital			-0.8
Self-employed in agriculture	-2.3	-1.6	-1.2
Self-employed other	-2.1	-1.8	-1.1

Source: authors' calculations based on CGE model.

It is worthwhile to mention that throughout scenarios the exports fall more or less marginally in the aftermath of the embargo. While this outcome may appear surprising, a more attentive look at the evolution of different exports is helpful (Table 4). Overall export of beverages indeed fall dramatically by around 20% under all scenarios, but this fall is partly offset by rise in other exports, most prominent of textiles, clothes, machinery, tobacco, and furniture.

Since trade flows to other trade partner areas are treated symmetrically the regional trade changes are much the same across the regions. The simulation also shows that other trade partner areas offset only partly the wine embargo: the beverages exports increase only by 1.5-3% to EU-27, other CIS and other world. This result is very important as it shows the 80%-increase in the EU quotas for Moldovan wines will provide only marginal boost for Moldovan wine exports; Moldovan wine-makers will most probably not be able to capitalize on the increase as their current exports to the EU are close to maximum levels of what they are able to sell on the EU market[14].

TABLE 4. CGE SIMULATION RESULTS: CHANGE IN REAL EXPORTS BY CATEGORY OF GOODS, % CHANGE RELATIVE TO BASE RUN

	BASE	UNEMPL-T	IMMOBILITY	FULL EMPL-T
Agriculture and foodstuffs	19.9	-0.1	0. 6	-0.1
Extraction of raw materials	0.7	0.1	1.5	0.6
Meat and fish	0.9	-0.1	0.9	0.2
Fruits and vegetables	5.0	-0.4	0.7	-0.3
Oils and fats	7.2	0.4	1.7	0.5
Dairy products	1.0	0	1.2	0.3
Other food	1.6	-0. 2	1.5	-0.2
Beverages	17.1	-20.1	-19.0	-20.0
Tobacco products	0.8	2.3	5.1	1.8
Textile products	6.9	2.8	6.3	33.8
Clothing	32.9	3.3	7.5	4.8
Wood products	0.6	1.0	1.9	0.8
Paper and paper products	1.3	-0.6	0.6	-0.2
Printing	1.0	0.1	1.5	0.3
Coke, oil refinery, chemical	2.8	0.4	1.8	0.6
Rubber and plastics	3.5	0.2	1.1	0.5
Other non-metallic minerals	9.2	0.1	-1.0	0.4
Machinery and equipment	25.0	2.4	2.3	3.9
Furniture and other products	4.2	0.8	2.5	1.3
Construction	1.9	0.2	-0.3	0.3
Hotels and restaurants	6. 5	0.1	1.4	0.3
Transport and warehousing	45. 8	-0.1	1.1	0.3
Communication	12.5	0. 4	1.2	0.4
Financial activities	1.2	0.4	1.2	0.3
Computers and related activities	1.8	0.3	1.8	0.7
Other commercial services	0.6	-0.9	0.3	-0.5

Source: authors' calculations based on CGE model.

CGE simulations also show Moldovan imports to marginally decrease by degree of 0.1-0.7%, in the mid- and short-term, respectively. This decrease is observed across most

[14] This outcome is also indirectly supported by discussion with Moldovan wine-makers that estimate that Moldovan wine exports in the EU in 2011 may increase at best by 10% in comparison with 2010.

of the imported goods categories; with only beverages and textiles (overtly dependent on "lohn" production) showing any meaningful increases (Table 5).

TABLE 5. CGE SIMULATION RESULTS: CHANGE IN REAL IMPORTS, % CHANGE RELATIVE TO BASE RUN

	BASE	UNEMPL-T	IMMOBILITY	FULL EMPL-T
Agriculture and foodstuffs	13.7	-2.4	-1.7	-1. 2
Extraction of raw materials	34. 6	-0.8	-0.5	-0.4
Meat and fish	7.2	-1.4	-0.9	-0.7
Fruits and vegetables	7.9	-1.4	-0.9	-0.8
Oils and fats	2.4	-1.7	-1.3	-0.8
Dairy products	3.0	-1.3	-0.9	-0.6
Animal feed	1.7	-1.8	-1.0	-1.0
Other food	9.0	-2.1	-1.7	-1.5
Beverages	7.4	1.4	1.8	2.2
Tobacco products	7.7	-1.1	-0.5	-0.4
Textile products	6.7	1.1	3.4	4.1
Clothing	13.2	-0.5	0.3	0.1
Wood products	1.0	-0.5	-0.1	-0.1
Paper and paper products	9.9	-1.1	-0.3	-0.7
Printing	2.6	-1.1	-0.7	-0.6
Coke, oil refinery, chemical	141.6	-0.9	-0.2	-0.3
Rubber and plastics	22.3	-0.8	-0.3	-0.3
Other non-metallic minerals	16.6	-0.9	0.2	-0.5
Machinery and equipment	96.0	-0.3	0. 1	0.1
Furniture and other products	13.4	-0.9	-0.4	-0.4
Electricity, gas and water distribution	14.6	-0.9	-0.7	-0.3
Construction	2.4	-0.6	0.2	-0.3
Hotels and restaurants	8.0	-1.3	-1.1	-0.6
Transport and warehousing	31.7	-1.5	-1.1	-0.8
Communication	8.3	-1.7	-1.2	-0.8
Financial activities	3.6	-1.8	-1.3	-0.7
Real estate transactions	0.8	-1.8	-1. 3	-0.8
Computers and related activities	4.0	-0.6	-0. 9	-0.5
Other commercial services	2.5	-1.1	-1.0	-0.5
Governmental services	0.3	-0.5	-1.2	-0.6

Source: authors' calculations based on CGE model.

Total output falls by 0.6% (Table 6) as the immediate shock effects start kicking in; however, as labour and then capital become fully mobile and employed the shock effects of the embargo fade away. As expected 'beverages' fall by around 10% throughout all the period, with labor and capital moving out from the sector. This implies that this sector will be subjected to considerable downsizing restructuring and should become smaller in size even as the shock of an eventual embargo will be absorbed. At the same time, offsetting gains are expected to come from textile

products, clothing, as well as machinery and equipment. All of these sectors have a growing role in exports, some of them have substantial imported intermediate inputs (mostly textiles and clothing), and some of them have short production cycle which facilitates access to the bank credit. As a result, these sectors attract a disproportionate share of the resources that are newly devoted to the production of exports.

TABLE 6. SIMULATION RESULTS: SECTORS OUTPUT AND MACRO VARIABLES, % CHANGE FROM BASE RUN.

	BASE	UNEMPL-T	IMMOBILITY	FULL EMPL-T
Agriculture, viniculture, forestry	8.7	-3.2	-1.3	-1.6
Small agriculture activities	45.3	0	0	0
Extraction of raw materials	2.7	-0.4	0.5	0.1
Meat and fish	2.9	-0.8	-0.1	-0.3
Fruits and vegetables	2.2	-0.8	0.1	-0.5
Oils and fats	1.8	-0.2	0. 8	0.1
Dairy products	2.3	-0.7	0	-0.2
Animal feed	0.5	-1.0	0.1	-0.5
Other food	7.7	-1.6	-0.9	-1.2
Beverages	6.0	-9.7	-8.9	-9.4
Tobacco products	0.4	0. 2	1.6	0.4
Textile products	2.4	2.8	6.2	33.2
Clothing	6.6	3.0	6.8	4.3
Wood products	1.2	0.2	0.8	0.3
Paper and paper products	0.6	-0. 8	0.3	-0.4
Printing	2.4	-0.7	0.2	-0.3
Coke, oil refinery, chemical	1.1	-0.1	1.0	0.2
Rubber and plastics	2.0	-0. 2	0.6	0.2
Other non-metallic minerals	9.4	-0.4	-0.6	-0.1
Machinery and equipment	8.9	2.0	2.1	3.4
Furniture and other products	2.3	0.3	1. 7	0.8
Waste recovery and recycling	0. 6			0.3
Electricity, gas and water distribution	10.2	-0.7	0.1	0
Construction	27.9	-0.2	-0.1	0
Retail and wholesale trade	71.5	-1.0	-0.4	-0. 4
Hotels and restaurants	7.5	-0.4	0. 6	0
Transport and warehousing	32.2	-0.6	0.4	-0.1
Communication	35.7	-0.5	0.2	-0.1
Financial activities	33.6	-0.7	-0.1	-0.2
Real estate transactions	29.6	-0.7	-0.1	-0.2
Computers and related activities	4.09	-0.1	0.6	0.2
Research and development	2.1	0	0.4	0.2
Other commercial services	10.5	-1.0	-0.3	-0.5
Public administration	22.7	-0.3	-0.1	-0.1
Governmental services	60.6	-0.4	-0.1	-0.1

	BASE	UNEMPL-T	IMMOBILITY	FULL EMPL-T
Other services	1.6	-1.0	-0.3	-0.3
Services in private households	1.4	-0.6	-0.1	-0.2
TOTAL	469.2	-0.6	0	0

Source: authors' calculations based on CGE model.

As it can be seen from the simulations the eventual wine embargo would represent a severe blow for wine-making industry which is however offset by gains in textile and clothes as well as to a somewhat lesser extent in machinery and furniture manufacturing as economy absorbs shock and adjusts. This offset is probably best explained by the fact that these sectors could appear relatively more attractive for capital and could relatively easy (especially in the case of textile and clothes) absorb the freed labor force. These sector effects also ensure that an eventual embargo would lead only to marginal decreases in foreign trade and no impact of note over the country rate of GDP growth.

No less important is the fact that other markets, including EU, would not be able to offset the fall in demand for Moldovan wine resulted from an eventual Russian ban. The gains of Moldovan exporters on these markets would be slightly less than 2% much less than losses from closing of Russian market.

All in all, an eventual new embargo would not represent anymore a major blow for Moldovan economy as a whole (the share of wine-making in GDP is already a mere 1.5% after all), while it would obviously hit Moldovan wine sector already in dire state in the aftermath of the embargo of 2006, global financial crisis of 2008 and unhelpful state policies especially in the last years of Communist rule.

MAIN CONCLUSIONS

First of all, Moldovan wine industry is already in critical condition as a result of a series of external shocks and unsupportive domestic policy environment. As suggested by the Moldovan CGE model, an eventual new embargo would certainly add to the sector's woes, but at the same time would not represent anymore a dramatic blow; both because the wine industry partly managed to shed its excessive dependence on Russian market and because the already rolling juggernaut of problems could be only somewhat magnified by the new embargo. Given the continuous shrinking of the sector it is obvious that it is poised for a painstaking process of restructuring and consolidation. To put it in differently, keeping open the Russian market is important to provide a respite or to help keeping Moldovan wine sector on life support but not to bring it back to normal, pre-crisis, life.

Secondly, the access to Russian market (even with its reduced importance in circumstances described above) cannot be easily substituted by the increased access to the EU market. Our simulations (supported by the interviews with some wine exporters) show that in 2010 Moldovan wine exporters came close to achieving limits of its selling capacities on the EU market. In the short-term volumes of the wine exported to the EU may increase, *ceteris paribus*, only marginally, i.e. well below the volumes envisaged by the increased quotas. Therefore, expectations of smooth redirection of wine exports from Russia to the EU expressed by some politicians do not pass the reality check.

Thirdly, given the decreasing role of the ailing wine sector in domestic economy the overall impact of an eventual wine embargo over Moldovan economy would not be as dramatic as one could imagine. The economy could withstand embargo's negative impact by offsetting gains in other sectors mainly textiles and clothing, but also machinery and furniture. Overall, the total output will decrease only marginally and GDP will remain practically unchanged in long run.

Fourth, going beyond the scope of this study, it appears that keys to the future of the wine sector increasingly lie inside of Moldova and not abroad. Most of the issues critical to the survival and rehabilitation of wine-making relate to the efforts to be made at home, and less to those to be made abroad, but in conjunction but various involved actors, not companies alone.

An eventual strategy could rest on several major pillars:

- Administrative and legal: Streamlining legislative framework, cutting red-tape and reducing tax burden. This will help cutting costs of the wine-makers, andunleash innovation and development of smaller producers. It is also

critical in the absence of any meaningful financial support to industry on the Government's behalf;

- Financial: Joint agenda by the government, companies and banks is needed in order to financially jump-start the sector increasingly succumbing into insolvency. The donor support, akin to the one put forward by EBRD, will certainly be helpful.
- Quality and hygiene: More attention should be paid by companies to production processes and techniques in order to ensure respect for quality and hygiene standards and requirements.
- Promotion and marketing: The current way of wine promotion abroad is begging for overhaul. The process should be designed jointly by the companies and the Government, while activities carried out by professional bodies/businesses. At best, wine promotion should go hand in hand with wide Moldova's image promotion campaign abroad.
- Institutional: the way the Government communicates with the companies should be reviewed in order to provide more say to the companies perhaps via establishment of a private-public institution that would provide venue for the dialogue and be responsible for the implementation of the jointly designed activities.

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